CLAIMS

WHAT IS CLAIMED:

1.   A method for planning a mission profile in real time, comprising:

     ascertaining a plurality of target information, including a target location, a target velocity, and a target location error; and

     autonomously determining a pattern from the ascertained target information.

2.   The method of claim 1, wherein ascertaining the target information includes assuming a value for at least one of the target velocity and the target location error.

3.   The method of claim 1, wherein ascertaining the plurality of target information includes ascertaining a target location that places the target in the air, on the surface, or submerged underwater.

4.   The method of claim 1, wherein ascertaining the plurality of target information includes receiving at least one of the target location, target velocity, and target location error in a transmission.

5.   The method of claim 1, further comprising:

     dispensing at least a formation including at least one vehicle; and

     implementing the pattern with the vehicle.

6.   The method of claim 5, wherein ascertaining the target information includes:

     acquiring the target information at a platform from which the formation is dispensed;

     receiving at least the target location from a platform other than the platform from which the formation is dispensed; or

     acquiring the target information aboard the vehicle.

7.   The method of claim 5, wherein dispensing the formation includes:

     launching the formation from an airborne platform; or

     launching the formation from a surface-based platform; or

     launching the formation from an underwater platform.

8.   The method of claim 5, wherein the vehicle includes a vehicle selected from the group consisting of a submersible vehicle, a reconnaissance drone, a flying submunition, a cruise missile, and a smart bomb.

9.   The method of claim 1, wherein autonomously determining the pattern from the ascertained target information includes autonomously determining a serpentine pattern or a fan blade pattern.

10.   The method of claim 1, wherein autonomously determining the pattern from the ascertained target information includes:

projecting along a target axis a direction opposite a target heading defined by the target velocity a distance of at least twice the target location error to establish an intersection of the target axis with the target location error;

projecting left and right relative to the target axis from the intersection a distance at least as great as one-half the target location error to determine a pair of possible start points;

selecting the possible start point closest to the platform;

determining a dispense point;

laying out a trace from the selected start point; and

translating the trace along a heading defined by the target velocity a distance determined by the elapsed time of travel for the platform to the dispense point and for a vehicle from the dispense point to the start point.

11.   The method of claim 10, further comprising:

dispensing a formation including at least one vehicle, at the dispense point defined by the preplanned mission profile; and

implementing the pattern with the formation at the selected start point.

12.   The method of claim 11, further comprising adjusting the selected start point by a predetermined distance along a leg of the trace.

13.   The method of claim 10, wherein projecting along the target axis opposite the target heading includes projecting 180° relative to the target heading.

1   14.   The method of claim 10, wherein projecting left and right includes projecting

2   ±90°.

1   15.   The method of claim 1, further comprising identifying the target.

1   16.   The method of claim 15, wherein identifying the target includes employing an

2   automatic target recognition system.

1   17.   The method of claim 15, further comprising attacking the target.

1   18.   A method for planning a mission profile in real time, comprising:

2   ascertaining a plurality of target information, including a target location, a target

       velocity, and a target location error; and

     autonomously determining a pattern including a trace from the ascertained target

       information, including:

         projecting along a target axis a direction opposite a target heading defined by

           the target velocity a distance of at least twice the target location error

           to establish an intersection of the target axis with the target location

           error;

         projecting left and right relative to the target axis from the intersection a

           distance at least as great as one-half the target location error to

           determine a pair of possible start points;

13   selecting the possible start point closest to the platform;

14   determining a dispense point;

15   laying out a trace from the selected start point; and

16   translating the trace along a heading defined by the target velocity a distance

17   determined by the elapsed time of travel for the platform to the

18   dispense point and for a vehicle from the dispense point to the start

19   point.

1   19.   The method of claim 18, wherein ascertaining the target information includes

2   assuming a value for at least one of the target velocity and the target location error.

1   20.   The method of claim 18, wherein ascertaining the plurality of target

2 information includes ascertaining a target location that places the target in the air, on the

3 surface, or submerged underwater.

1   21.   The method of claim 18, wherein ascertaining the plurality of target

2 information includes receiving at least one of the target location, target velocity, and target

3 location error in a transmission.

1   22.   The method of claim 18, further comprising:

2 dispensing at least a formation including at least one vehicle; and

3 implementing the pattern with the vehicle.

23.   The method of claim 22, wherein ascertaining the target information includes:

acquiring the target information at a platform from which the formation is dispensed;

receiving at least the target location from a platform other than the platform from

which the formation is dispensed; or

acquiring the target information aboard the vehicle.

24.   The method of claim 22, wherein dispensing the formation includes:

launching the formation from an airborne platform; or

launching the formation from a surface-based platform; or

launching the formation from an underwater platform.

1   25.   The method of claim 22, wherein the vehicle includes a vehicle selected from

2 the group consisting of a submersible vehicle, a reconnaissance drone, a flying submunition,

3 a cruise missile, and a smart bomb.

1   26.   The method of claim 18, wherein autonomously determining the pattern from

2 the ascertained target information includes autonomously determining a serpentine pattern or

3 a fan blade pattern.

1   27.   The method of claim 18, further comprising:

2 dispensing a formation including at least one vehicle at the dispense point defined by

3 the preplanned mission profile; and

4 implementing the pattern with the formation at the selected start point.

1   28.   The method of claim 27, further comprising adjusting the selected start point

2   by a predetermined distance along a leg the trace.

1   29.   The method of claim 18, wherein projecting along the target axis opposite the

2   target heading includes projecting 180° relative to the target heading.

1   30.   The method of claim 18, wherein projecting left and right includes projecting

2   ±90°.

1   31.   The method of claim 18, further comprising identifying the target.

1   32.   The method of claim 31, wherein identifying the target includes employing an

2   automatic target recognition system.

33.   The method of claim 31, further comprising attacking the target.

34.   An apparatus for use in planning a mission profile in real time, comprising:

a receiver capable of receiving a plurality of target information, the target information

including a target location;

a computing device; and

a program storage device encoded with instructions that, when executed by the

computing device, perform a method for autonomously determining a pattern

from the target information.

1   35.   The apparatus of claim 34, wherein the method for autonomously determining

2   the pattern from the target information includes assuming a value for at least one of a target

3   velocity and a target location error.

1   36.   The apparatus of claim 34, wherein the receiver, the computing device, and

2   the program storage device are distributed across a platform and a vehicle.

1   37.   The apparatus of claim 36, wherein the platform is an airborne platform, a

2   surface platform, or a submerged platform.

1   38.   The apparatus of claim 36, wherein the vehicle includes a vehicle selected

2   from the group consisting of a submersible vehicle, a reconnaissance drone, a flying

3   submunition, a cruise missile, and a smart bomb.

1   39.   The apparatus of claim 34, wherein the receiver, the computing device, and

2 the program storage device comprise a portion of a platform.

1   40.   The apparatus of claim 39, wherein the platform is an airborne platform, a

2 surface platform, or a submerged platform.

1   41.   The apparatus of claim 34, wherein the receiver, the computing device, and

2 the program storage device comprise a portion of a vehicle.

1   42.   The apparatus of claim 41, wherein the vehicle includes a vehicle selected

2 from the group consisting of a submersible vehicle, a reconnaissance drone, a flying

3 submunition, a cruise missile, and a smart bomb.

    43.   The apparatus of claim 34, wherein the encoded method for autonomously
determining the pattern from the ascertained target information includes autonomously
determining a serpentine pattern or a fan blade pattern.

    44.   The apparatus of claim 34, wherein the encoded method for autonomously
determining the pattern includes:

        projecting along a target axis 180° off the target velocity a distance of at least twice
                the target location error to establish an intersection of the target axis with the
                target location error;

6   projecting left and right relative to the target axis from the intersection a distance at

7   least as great as one-half the target location error to determine a pair of

8   possible start points;

9   selecting the possible start point closest to the platform;

10   determining a dispense point;

11   laying out a trace from the selected start point; and

12   translating the trace along a heading defined by the target velocity a distance

13   determined by the elapsed time of travel for the platform to the dispense point

14   and for a vehicle from the dispense point to the start point.

1   45.   The apparatus of claim 44, wherein the encoded method for autonomously

2 determining the pattern further comprises adjusting the selected start point by a

3 predetermined distance along a leg of the trace.

46. The apparatus of claim 44, wherein the projecting along the target axis opposite the target heading in the encoded method includes projecting 180° relative to the target heading.

47. The apparatus of claim 44, wherein projecting left and right in the encoded method includes projecting ±90°.

48. The apparatus of claim 34, further comprising an automatic target recognition system.

49. The apparatus of claim 48, wherein the method for autonomously determining the pattern further comprises identifying the target.

50. An apparatus for planning a mission profile in real time, comprising:

a receiver capable of receiving a plurality of target information, the target information including a target location;

a computing device; and

a program storage device encoded with instructions that, when executed by the computing device, perform a method for autonomously determining a pattern from the ascertained target information, the method including:

projecting along a target axis a direction opposite a target heading defined by the target velocity a distance of at least twice the target location error to establish an intersection of the target axis with the target location error;

projecting left and right relative to the target axis from the intersection a distance at least as great as one-half the target location error to determine a pair of possible start points;

selecting the possible start point closest to the platform;

determining a dispense point;

laying out a trace from the selected start point; and

translating the trace along a heading defined by the target velocity a distance determined by the elapsed time of travel for the platform to the dispense point and for a vehicle from the dispense point to the start point.

51.　The apparatus of claim 50, wherein the method for autonomously determining the pattern from the target information includes assuming a value for at least one of a target velocity and a target location error.

52.　The apparatus of claim 50, wherein the receiver, the computing device, and the program storage device are distributed across a platform and a vehicle.

53.　The apparatus of claim 52, wherein the platform is an airborne platform, a surface platform, or a submerged platform.

54.　The apparatus of claim 52, wherein the vehicle includes a vehicle selected from the group consisting of a submersible vehicle, a reconnaissance drone, a flying submunition, a cruise missile, and a smart bomb.

55.　The apparatus of claim 50, wherein the receiver, the computing device, and the program storage device comprise a portion of a platform.

56.　The apparatus of claim 55, wherein the platform is an airborne platform, a surface platform, or a submerged platform.

57.　The apparatus of claim 50, wherein the receiver, the computing device, and the program storage device comprise a portion of a vehicle.

58.　The apparatus of claim 57, wherein the vehicle includes a vehicle selected from the group consisting of a submersible vehicle, a reconnaissance drone, a flying submunition, a cruise missile, and a smart bomb.

59.　The apparatus of claim 50, wherein the method for autonomously determining the pattern from the ascertained target information includes autonomously determining a serpentine pattern or a fan blade pattern.

60.　The apparatus of claim 50, wherein the method for autonomously determining the pattern further comprises adjusting the selected start point by a predetermined distance along a leg of the trace.

1   61.   The apparatus of claim 50, wherein projecting along the target axis opposite
2   the target heading in the encoded method includes projecting 180° relative to the target
3   heading.

1   62.   The apparatus of claim 50, wherein projecting left and right in the encoded
2   method includes projecting ±90°.

1   63.   The apparatus of claim 50, further comprising an automatic target recognition
2   system.

1   64.   The apparatus of claim 63, wherein the method for autonomously determining
2   the pattern further comprises identifying the target.

     65.   An apparatus capable of planning a mission profile in real time, comprising:
            a platform, including
                   a receiver capable of receiving a plurality of target information, the target
                          information including a target location;
            a first computing device; and
            a first program storage device encoded with instructions that, when executed
                   by the computing device, perform a method for autonomously
                   determining a pattern from the ascertained target information, the
                   method including:
10   projecting along a target axis a direction opposite a target heading
11   defined by the target velocity a distance of at least twice the
12   target location error to establish an intersection of the target
13   axis with the target location error;
14   projecting left and right relative to the target axis from the intersection
15   a distance at least as great as one-half the target location error
16   to determine a pair of possible start points;
17   selecting the possible start point closest to the platform;
18   determining a dispense point;
19   laying out a trace from the selected start point; and
20   translating the trace along a heading defined by the target velocity a
21   distance determined by the elapsed time of travel for the

22   platform to the dispense point and for a vehicle from the

23   dispense point to the start point; and

24   a vehicle, including:

25   a second program storage device capable of being encoded with the pattern by

26   the first computing device; and

27   a second computing device capable of implementing the pattern encoded on

28   the second program storage device through control of the vehicle.

1   66.   The apparatus of claim 65, wherein the method for autonomously determining

2 the pattern from the target information includes assuming a value for at least one of a target

3 velocity and a target location error.

67.   The apparatus of claim 65, wherein the platform is an airborne platform, a surface platform, or a submerged platform.

68.   The apparatus of claim 65, wherein the vehicle includes a vehicle selected from the group consisting of a submersible vehicle, a reconnaissance drone, a flying submunition, a cruise missile, and a smart bomb.

69.   The apparatus of claim 65, wherein the method for autonomously determining the pattern from the ascertained target information includes autonomously determining a serpentine pattern or a fan blade pattern.

1   70.   The apparatus of claim 65, wherein the method for autonomously determining

2 the pattern further comprises adjusting the selected start point by a predetermined distance

3 along a leg of the trace.

1   71.   The apparatus of claim 65, wherein projecting along the target axis opposite

2 the target heading in the encoded method includes projecting 180° relative to the target

3 heading.

1   72.   The apparatus of claim 65, wherein projecting left and right in the encoded

2 method includes projecting ±90°.

1   73.   The apparatus of claim 65, further comprising an automatic target recognition

2 system.

74.   The apparatus of claim 73, wherein the method for autonomously determining the pattern further comprises identifying the target.

75.   An apparatus for planning a mission profile in real time, comprising:
   means for ascertaining a plurality of target information, including a target location, a target velocity, and a target location error; and
   means for autonomously determining a pattern from the ascertained target information.